

# ABSTRACTS

## MEASURING INDIVIDUAL FEED EFFICIENCY AND ITS CORRELATIONS WITH PERFORMANCES AND AGONISTIC BEHAVIOURS IN JUVENILE NILE TILAPIA *Oreochromis niloticus* REARED IN GROUPS

Hugues de Verdal\*, Marc Vandeputte, Catherine M. O'Connell, Marie-Laure Bégout, Wagdy Mekkawy, Béatrice Chatain, John A.H. Benzie

CIRAD, UMR116 ISEM, 73 rue Jean-François Breton - 34398 Montpellier Cedex 5, France  
Worldfish, Jalan Batu Maung, Bayan Lepas, 11960, Penang, Malaysia  
hugues.de\_verdal@cirad.fr

Estimating individual feed intake of fish held in groups has long been a challenge precluding precise knowledge of the individual variation in feed efficiency (FE).

In this study, we measured individual feed conversion ratio (FCR) of 100 juvenile Nile tilapia *Oreochromis niloticus* held in groups and estimated the correlations between FCR, performance and agonistic behavioural traits.

For this purpose, fish were video-recorded to estimate the occurrence of agonistic behaviour during a fasting and a refeeding period, occurring just before the individual feed intake (FI) measurement. To measure FI, we counted the number of feed pellets eaten by each individual tilapia using video recordings made over a period of 10 days where fish were fed twice daily.

Accumulated measures of FI over 11 meals were found to achieve 95% repeatability and a highly accurate FI estimate. Thus, with this approach, we can accurately investigate FI and FCR in fish.

During the FI measurement period, average fish growth was  $12.0 \pm 3.6$  g and FCR was  $0.86 \pm 0.20$ . FCR was negatively correlated with body weight gain (BWG,  $r = -0.62 \pm 0.06$ ) but not with FI ( $r = -0.02 \pm 0.10$ ). Conversely, residual feed intake (RFI) was positively correlated with FI ( $r = 0.60 \pm 0.06$ ) but not with BWG ( $r = -0.03 \pm 0.10$ ). These findings highlight the complex relationships between the main feed efficiency traits, FCR and RFI.

Fish were 58% less aggressive during the fasting period compared to the refeeding period, but generally, an aggressive fish during the fasting period was also aggressive during the refeeding period.

The correlations between agonistic behaviour and growth and feed conversion ratio were low, and in most cases not significant. We conclude that the hierarchical rank and agonistic behaviour should not affect Nile tilapia growth and feed conversion ratio. Consequently, a dominant fish should not necessarily be more efficient than a subordinate fish.

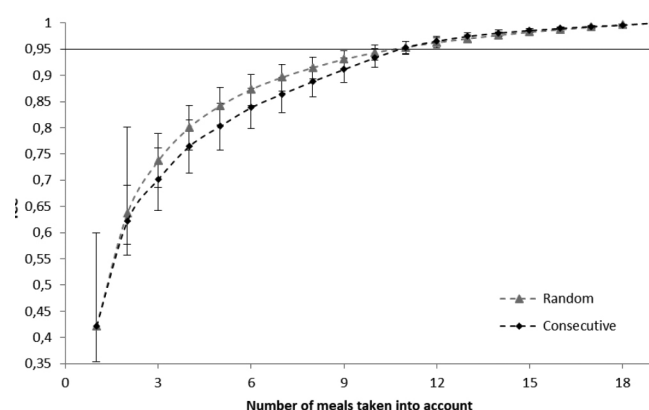


Figure 1- Estimation of the intra-class correlation (ICC) between FI (19 meals) and x consecutive (in black) or randomly chosen (in grey) meals (from 1 to 19).